

WHAT IS CLAIMED IS:

1. A method of manufacturing a multi-tip probe comprising the steps of:
making a cantilever using lithographic techniques; and
forming a plurality of electrodes at the cantilever by irradiating a focused charged particle beam.
2. The method of manufacturing a multi-tip probe according to claim 1, further comprising the steps of:
forming a plurality of lead portions by lithography and making a cantilever formed with a shunt area at a distal end thereof; and
forming electrodes at the shunt area by sputtering or gas-assisted etching of the distal end using a focused charged particle beam.
3. A method of manufacturing a multi-tip probe according to claim 1, further comprising the steps of:
making a cantilever formed with the plurality of lead portions using lithographic techniques; and
forming a plurality of electrodes at the distal end of the cantilever by irradiating a focused charged particle beam with blasting a source gas.
4. A method of manufacturing a multi-tip probe comprising the steps of:
making a cantilever formed with a plurality of lead portions using lithographic techniques; and
forming a plurality of conductive electrodes at a distal end

of the cantilever by ion implantation with irradiating a focused charged particle beam with source gas.

5. A method of manufacturing a multi-tip probe comprising the steps of:

making a cantilever formed a plurality of lead portions with a shunt area at a distal end using lithographic techniques; and forming a plurality of conductive electrodes by processing the shunt area of the distal end using photofabrication technology of resist exposure including one of X-ray exposure using a stepper, mask aligner and SOR or electron beam rendering, and performing dry or wet etching.

6. A method of manufacturing a multi-tip probe according to claim 1, further comprising a step of forming a needle-shaped probe by CVD in a surface of the electrodes as a probe using an FIB device.

7. A method of manufacturing a multi-tip probe according to claim 6, wherein the probe is formed from a structure having resilience.

8. A method of manufacturing a multi-tip probe according to claim 4, further comprising a step of forming a needle-shaped probe by CVD in a surface of the electrodes as a probe using an FIB device.

9. A method of manufacturing a multi-tip probe according to claim 8, wherein the probe is formed from a structure having resilience.

10. A method of manufacturing a multi-tip probe according to claims 1, further comprising a step of, in the method of manufacturing

the cantilever using lithographic techniques, forming a convex bank at the distal end of the cantilever.

11. A method of manufacturing a multi-tip probe according to claims 4, further comprising a step of, in the method of manufacturing the cantilever using lithographic techniques, forming a convex bank at the distal end of the cantilever.

12. A surface characteristic analysis apparatus comprising:
a cantilever having a multi-tip probe at a distal end;
a cantilever for AFM uses having a probe at a distal end with a known prescribed gap between the multi-tip probe; and
driving means for driving the cantilevers independently so as to be in contact/non-contact states with respect to the sample surface,

with functions being provided wherein the multi-tip probes are put into a non-contact state and an observed image is obtained for a sample surface using an AFM function, a measurement region is specified from the observed image, and the multi-tip probes are positioned at the specified regions and contact is made.

13. A surface characteristic analysis apparatus according to claim 12, wherein the driving means comprises a comb-shaped electrostatic actuator, or a piezoelectric microactuator.

14. A surface characteristic analysis device according to claim 12, wherein the AFM cantilever is a self-detecting-type cantilever equipped with a strain gauge.

15. A multi-tip probe comprising:

a cantilever formed using lithographic techniques; a plurality of lead portions formed on the cantilever; and

a plurality of electrodes connected to each of the lead portions, wherein pitch between the electrodes is narrower than pitch between the lead portions.

16. A multi-tip probe according to claim 15, wherein the cantilever comprises a convex bank in the region where the electrodes are formed.

17. A multi-tip probe according to claim 15, wherein the cantilever is provided with a probe for each electrode.

18. The multi-tip probe according to claim 17, wherein the probes are resilient members having conductance.